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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/032,932	12/28/2001	Richard E. Smalley	11321-P012USD6	9910

7590 10/05/2004

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EXAMINER

LISH, PETER J

ART UNIT	PAPER NUMBER
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1754

DATE MAILED: 10/05/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/032,932

Applicant(s)

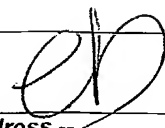
SMALLEY ET AL.

Examiner

Peter J Lish

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 38-41 and 163-168 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 38-41 is/are rejected.
- 7) ☒ Claim(s) 163-168 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 4/19/03 and 1/13/03
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 41 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 41 states that the subarrays are made by providing at least about 10^6 tubular carbon molecules. Claim 38, to which it depends, however, requires that the subarrays contain up to 10^6 single-walled carbon nanotubes. It is indefinite as to whether up to 10^6 nanotubes are required or whether at least 10^6 nanotubes are required. Additionally, it is noted that the “tubular carbon molecules” of claim 41 must be single-walled nanotubes; it is suggested that the claim be amended to read as such.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 38 is rejected under 35 U.S.C. 102(b) as being anticipated by Kiang et al.

(“Structural Modification of Single-Layer...”).

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Kiang et al. shows the process of single-walled nanotube bundling. The assembly of nanotube bundles during the formation of single-walled nanotubes is due to van der Waals forces, with tubes progressively zipping together. Kiang et al. also teach the movement of single-walled nanotubes into a bundle when heated by an electron beam. Both of these processes represent a step of assembling a composite array of single-walled nanotubes from subarrays of single-walled nanotubes.

Claims 39-40 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kiang et al. ("Structural Modification of Single-Layer...").

Kiang et al. is applied above. It is noted from the applicant's specification that the "type" of nanotube refers to its helicity, which is represented by the helicity indexes of (n,m), of which there are two major types. Bundles of single-walled nanotubes consisting solely of each type of nanotube (i.e. the same helicity throughout) are expected to exist in a nanotube sample. Therefore, it is expected that the process of assembling composite arrays, or bundles, takes place between subarrays, or bundles, of the same type as well as subarrays, or bundles, of differing types.

Claim 38 is rejected under 35 U.S.C. 102(b) as being anticipated by Kiang et al. ("Carbon Nanotubes with Single-Layer Walls").

Kiang et al. teaches the bundling of single-walled nanotubes, which gives rise to crystalline arrays. Kiang et al. shows two subarrays of single-walled nanotubes being aggregated

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into a composite array of nanotubes in Figure 2c (right side). The assembly of nanotube bundles during the formation of single-walled nanotubes is due to van der Waals forces. This occurrence represents a step of assembling a composite array of single-walled nanotubes from subarrays of single-walled nanotubes.

Claims 39-40 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kiang et al. ("Carbon Nanotubes with Single-Layer Walls").

Kiang et al. is applied above. It is noted from the applicant's specification that the "type" of nanotube refers to its helicity, which is represented by the helicity indexes of (n,m), of which there are two major types. Bundles of single-walled nanotubes consisting solely of each type of nanotube (i.e. the same helicity throughout) are expected to exist in a nanotube sample.

Therefore, it is expected that the process of assembling composite arrays, or bundles, takes place between subarrays, or bundles, of the same type as well as subarrays, or bundles, of differing types.

Allowable Subject Matter

Claims 163-168 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Lish whose telephone number is 571-272-1354. The examiner can normally be reached on 9:00-6:00 Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PL



STUART L. HENDRICKSON
PRIMARY EXAMINER